

Stilling Basin Abrasion Research
Principal Investigator : Leslie Hanna, Hydraulic Engineer, WRRL

Background

Reclamation Type II and Type III stilling basins have experienced significant abrasion damage caused by rock, gravel, and sand brought into the basins by reverse flow over the basin end sill as a result of normal operation of a hydraulic jump energy dissipation basin (figure 1). Damage occurs when material, carried into the basin, becomes trapped and turbulent flow continually moves the material about the surface causing severe damage to concrete.

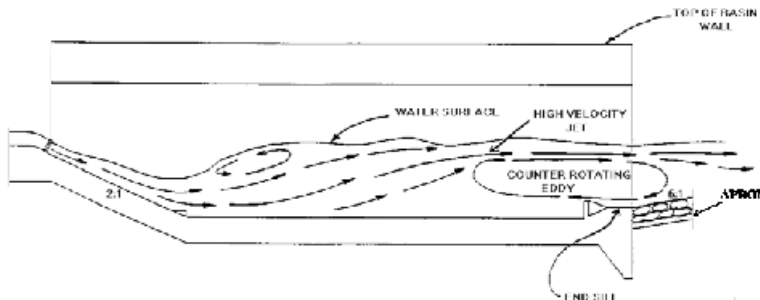


Figure 1. Counter-rotating flow eddy over basin end sill and lower apron.

Research conducted by Reclamations's Water Resources Research Laboratory (WRRL) has demonstrated that the installation of flow deflectors can improve or eliminate the potential for moving materials into the basin, thereby minimizing damage and extending the life of the basin.

Future or Continuing Work

- ! The Science and Technology program has recently approved research funding for conducting a model study of the Mason Dam outlet works stilling basin to develop a flow deflector design for the basin.
- ! The design will be implemented at the Mason Dam facility in FY03. Field monitoring and evaluations will be used to refine and verify the effectiveness of the final design. This will provide the documentation necessary to pave the way for the installation of flow deflectors throughout Reclamation's facilities.

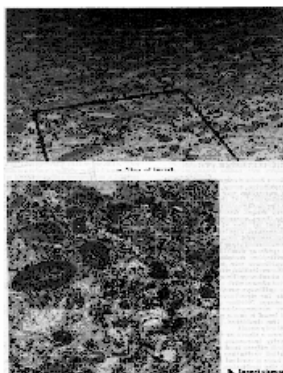


Figure 2. Typical abrasion damage.

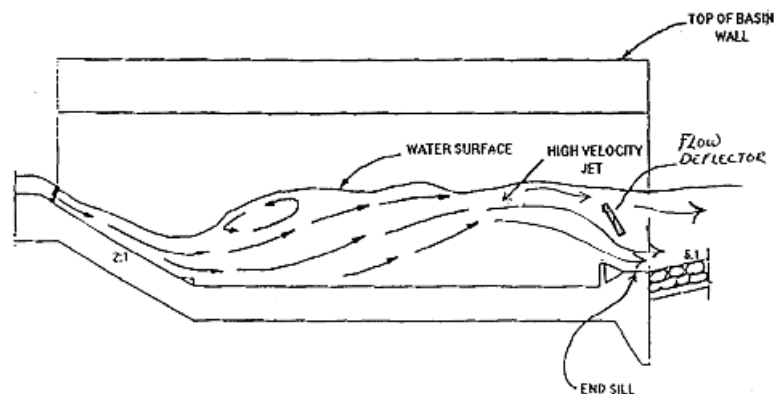


Figure 3. Desired flow pattern with deflector installed.